

SYNCRON

8

THE ADVANCED MICROCOMPUTER SYSTEM



The Synchron-8 is a revolutionary 8080 microcomputer system which far outclasses any other available system. It was designed with the small business world in mind where reliability, durable construction, ease of utilization, and ease of interfacing are the watchwords; the same features required in personal computing. We are convinced that if you compare the Synchron-8 to any other system feature-by-feature, you can make no other choice.

Integral Cassette Operating System. No more tiresome loading of a program bit-by-bit. Once a program is working the way you want it to, it can be dumped to an inexpensive cassette recorder and reloaded into the system in a matter of seconds.

Bootstrap Firmware. On power up, the Synchron-8 is ready to accept a program from cassette or floppy to be executed. That is because the cassette bootstrap loader is in phantom PROM which is temporarily pulled down to location zero on power up or reset. Normally the bootstrap would either have to be toggled in or an additional PROM board would have to be purchased. In addition to the loader, there are 512 uncommitted bytes of firmware on the CPU board which can be user programmed.

Soft Executive. The executive which monitors and controls system functioning is in software which is loaded with the program to be executed on power up. With the executive in software, it is completely flexible — it can be tailored to a particular user or application, updated, etc.

Expandibility. The Synchron, like most of the better computers, is a bus-oriented system. The data bus, the address bus, and the control bus span the full system width on the motherboard making all information available to each module. This enables a user to tailor a system to his needs by the selection of modules. Should a unique circuit be necessary, the Synchron is perhaps the easiest system to so expand: Synchron-compatible cards are manufactured by Vector and are available everywhere. In most cases bus signals require no buffering.

Software Availability. All available indications are that the 8080 has won the battle of the microprocessors. As a consequence there is far more software available for the 8080 than for any other microprocessor. Because there are more people working on 8080 software the lead is increasing daily.

Reliability. All manufacturing steps which increase reliability have been taken including: high quality epoxy boards, plated through holes, individually inspected connections, and a complete burn-in with program check out on every board. You know it works!

Optimized Real Time Operation. The Synchron-8 has a timer section which includes five programmable crystal controlled interval timers which provide timed intervals in increments from 64 microseconds to 16.32 milliseconds. Much longer intervals may be generated by cascading the timers via software control. These timers do their work without CPU attention which frees the CPU for more important tasks. This can vastly simplify programming and makes the Synchron-8, for most real operations, the fastest 8080 system around.

Central Processor Module

The Central Processor Module (CPM) provides features which in other systems require the support of additional hardware. The inclusion of sockets for up to 1024 bytes of PROM almost always eliminates the need for an additional PROM board. The unique power-up and reset circuit eliminates the need for a front panel without dedicating page zero of memory to PROM. This allows start up from a reset, leaving page zero to RAM, which enables the use of popular software. The CPM also has a -5 v. bias generator, an interrupt buffer, and crystal-controlled clock.

The CPM comes complete with 512 bytes of preprogrammed PROM. This PROM can be supplied to enable initialization from either the cassette, the floppy disk, or the telephone.

Video Control Module

The Video Control Module (VCM) is a very inexpensive solution to display problems. Just connect the VCM's standard video output to any standard monitor or television and you will have a full 64 character by 16 line alpha-numeric display. Each character in the display can be any one of 128 symbols, displayed in either black-on-white or white-on-black format. The character set includes both upper and lower case, the standard special specials, and the lower case Greek alphabet; other character sets are available on special order. Computer access to the display is via a memory sharing technique which enables complex editing modes and a limited graphic capability. The VCM is supplied with a cassette which contains a video operating system and a collection of all necessary subroutines to support the various editing operations.

General Communications Module

The General Communications Module (GCM) transforms your Synchron into part of a world wide communications network. By connecting directly to the telephone network the GCM provides communication with any of over a quarter million businesses, educational institutions, information services, libraries, etc. Such diverse services as the London gold prices, daily ski reports, and computer time sharing are available.

The GCM comes with two complete, optically-isolated, telephone interfaces. Either of these interfaces may be coupled to either a Bell type 103 compatible FSK signal or a synchronous bi-phase encoded signal compatible with the popular Tarbell format.

Additional I/O includes a baud-rate programmable RS-232C interfaces, a Tarbell compatible cassette interface, and a general purpose parallel interface, usually used to interface to a keyboard. Besides these I/O capabilities the GCM also provides 5 programmable interval times and either a vector or polled interrupt system.

Floppy Disk Control Module

The Floppy Disk Control Module (FDCM) provides big system performance at a micro price. This is ~~not, however,~~ a Direct Memory Access (DMA), to achieve the maximum transfer rate possible from the disk (250 kilobaud), while using less than 16 per cent of the processors time. The FDCM is designed to control either the PerSci model 70 single diskette drive or the more cost effective model 277 dual drive..

In addition, the FDCM comes with a sophisticated operating system, closely resembling that of the DEC System-10, which provides a named file system that supports up to 64 distinct files on each diskette and drives up to four different diskette drives (two dual drives). File storage is dynamically allocated and released as necessary and any file may contain up to 250 kilobytes of information. The system comes with a diskette which contains an editor, an assembler, a dynamic debugging tool, the basic disk operating system and a complete set of manuals.

4K RAM Module

The 4K RAM Module contains sockets for 4096 8-bit bytes of memory. The board uses all low power 2102s to minimize power consumption with decoupling on every chip.

Applications

Word processing
Legal precedent libraries
Inventory control
Accounting control
Text editing
Instrument control
Billing

Reference search
Computer games
Payroll
Data entry terminal
Automated ordering
Service & sales files
Fire & burglar alarms

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SYMBIOTIC SYSTEMS**Direct Sales Price List**

effective March 1, 1977

CPM-1

Central processor module with Prom
for positive logic ascii keyboard.....\$199.99

CPM-2

with negative logic Prom.....\$199.00

CPM-3

without Proms.....\$160.00

4K Ram

4K X 8, low power, 450 nsec.....\$175.00

VDM

Video Module 16 lines by 64 characters.....\$220.00

Backplane

with 20 36/72 .1" P.C. connectors & rails.....\$180.00

without rails & connectors.....\$ 35.00

connectors ea.....\$ 5.18

GCM

general communications module
phone, twx, parallel keyboard,
cassette & RS232 interfaces.....\$299.00

Regulated Power Supply-open frame

5v at 7amps, 12v at 1amp
-9v at 1.2amps.....\$130.00

Development System

CPM, 2 4K RAMS, 1/2 4K RAM (operating system),
VDM, Backplane, GCM, manual with operating
system including Assembler and Basic.....\$1,200.00

Packaged System

Same as above but with 12K RAM, power supply,
keyboard, cables, chassis and cassette recorder.....\$2,700.00

Carterfone S15B Data Terminal

selectric style, 138 baud printer.....\$1,295.00

All boards include 8080 driver routines

Prices F.O.B. Symbiotic Systems

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Prices and Specifications subject to change.